

SOME NEW BOOKS.

Evolution and Immortality.

There has been of recent years a pronounced disposition among biologists to restate, or rather to redistribute and reweigh, the evidence for the doctrine of evolution. To the general reader, however, it is not the re-statement of the doctrine, but the re-weighing of the evidence for it, which has become a matter of deep interest to learn the practical outcome of the movement to which we have referred. Has it shaken the foundations of the evolutionary hypothesis, or has it, at all events, affected the materialistic implications popularly ascribed to the theory? To answer these questions is the aim of a new and much enlarged edition of the book entitled *Evolution and Its Relation to Religious Thought*, by JOSEPH LE CONTE, Professor of Biology and Natural History at the University of California. In this edition of his work the author has devoted a chapter to the consideration of the factors of evolution, their number and relative importance, and to an examination of the position taken by the Neo-Darwinists, including conspicuously Prof. Weismann. No moderate evolutionist with the specific purpose of his book, the author proceeds to discuss some fundamental religious questions upon which he did not touch at all in his first edition. Such are the topics of first and second causes, of general and special evidence of the natural and supernatural, of mind, of mechanism, of nature, and of the mode of creation. The only other important additions are concerned with the relation of man to nature and the relation of evolution to Christianity. In the present notice we shall first glance at what the author has to say regarding the factors of evolution, and the proposed regrading of the factors of evolution, and then pass directly to his view of the origin and destiny of man's spirit. From the relation of man to nature one would proceed by a natural transition to the relation of God to man, but for what the author has to say upon the latter subject we must refer the reader to the book itself.

What are the factors of evolution and what is the relative importance of their respective contributions? What may be termed the orthodox Darwinian view, and how does it differ from the view of the author? The author, Darwin himself and Mr. Herbert Spencer, recognize two Lamarckian factors, namely, the pressure of the environment and the use and disuse of parts, and two Darwinian factors, to wit, natural selection and sexual selection. The two great founders of the theory of evolution, Darwin and Spencer, differ mainly as regards the relative importance of the two sets of factors, Spencer considering the Lamarckian factors the most potent and Darwin ascribing the larger influence to the factors associated with his name. Mr. George J. Romanes would add a fifth factor, which he calls physiological selection, while Prof. Le Conte and others affirm the existence of a sixth factor, viz., the interposition of reason where the development of human beings is concerned. Opposed to these upholders of a plurality of factors are the Neo-Darwinists, at whose head stands the author, who maintains that the Lamarckian factors are wholly without effect, and that the Darwinian factors are the only ones which have any effect. The latter out-Darwin Darwin himself in their exaltation of the most distinctive Darwinian factor, natural selection. They aim to show that natural selection is the sole and sufficient cause of evolution; that changes in individuals, Darwin and Spencer differ mainly in their view of the origin and mode of inheritance, and that Lamarck was wholly wrong; that Darwin in connection with Wallace was the sole founder of the true theory of evolution, and finally that Darwin himself was wrong only in so far as he made any terms whatever for the Lamarckian factors.

Prof. Le Conte concedes that the reasons for the Neo-Darwinian view have been most strongly put by Weismann. They are based mainly on the Freiburg professor's celebrated theory of the immortality and immutability of germ cells according to which the germ cells of the individual body are wholly unmodified in function, viz., somatic cells and germ cells, the latter including both the male and female sexual elements. Somatic cells—the adjective is, of course, derived from the Greek word *soma*, meaning body—are the cells which again divide into somatic and germ cells, and are unmodified in function, while the germ cells, according to Weismann, inheritance takes place only through germ cells, while the environment affects exclusively the somatic cells. Consequently, changes produced by the environment cannot be inherited. Sexual modes of reproduction, which are necessary for the purpose of producing variability in progeny, and thus furnishing materials for natural selection, as this was the only means of evolutionary advance. It is well known that Weismann made various experiments on animals, especially by mutilation, to show that somatic changes are not inherited.

The author of this book does not accept the conclusions of the Neo-Darwinists. He follows Spencer in affirming the Lamarckian factors to be true factors, because there was a time when there were no others. They were therefore necessary to start the process of evolution, even if they were necessary at present. He goes on to argue that if these factors were over operative they must be so still, though possibly in a subordinate degree. A lower factor is not abolished, but only becomes subordinate to a higher when the latter is introduced. This may well be said that Lamarckian factors, the pressure of the environment and the effect of use and disuse, are comparatively feeble at the present time and among living species, especially of the higher animals, and yet not absent altogether. In the earliest stages of evolution there was a simple identity of function between somatic and germ cells, and the pressure of the environment must have been inherited and increased from generation to generation. Moreover, the differentiation of the germ and somatic cells was not effected at all once, nor is the somatic relation even now completely severed. It was a gradual process, and therefore the effect of the environment on the germ cells through the somatic cells continued, though in decreasing degree, and still continues. Prof. Le Conte acknowledges, however, that the differentiation of the higher animals is now so complete that germ cells are probably not at all affected by changes in somatic cells unless these changes are long continued in the same direction and are not antagonized by natural selection. The present tendency of germ cells to immutability is but a recent development, and it is by the higher organisms, to the interior of the body, where they are more and more protected from external influences. There is also a moral aspect of the Neo-Darwinist position which causes the author of this book to reject the conclusion that the power of transmitting somatic changes by inheritance has not been wholly lost. If Weismann and Wallace were right, if natural selection were the exclusive factor of evolution, we should have to forego the hope of race improvement, physical, mental, and moral; for the force and pitiless operation of natural selection will never be tormented by civilized man, as it is by nature in those of the lower organisms. Man's spiritual nature welcomes a recourse to the Lamarckian factors of environment and use and disuse, but rejects at the exclusive and unscrupulous employment of natural selection. On this point the author dwells at length and with great force, and points out the main ethical significance of physical culture.

and hygiene, although designed primarily to secure the strength, the health, the happiness of the present generation, yet are sustained and ennobled by the conviction that the improvement of the individuals of each generation leads through inheritance to the gradual physical and mental elevation of the race. So all our systems of intellectual and moral education, though certainly intended mainly for the development of the individual, are dignified by the hope that the race also is thereby gradually elevated. Prof. Le Conte indeed acknowledges that this hope is usually extravagant; that the whole improvement of one generation is not carried over by inheritance to the next, and that consequently we cannot by education raise a lower race up to the plane of a higher in a few generations, or even in a few centuries. He is convinced, however, that there must be at least a small residue of inheritance carried forward from each generation to the next, which, accumulating from age to age, determines the slow evolution of mankind. Such, at all events, is the hope on which all noble efforts for race improvement are founded. But this hope, he says, must be abandoned if Weismann and Wallace are right. If it be true that reason must direct the course of human progress, and if it be also true that selection of the fittest in the biological, organic sense is the only method which reason can employ, then the dreadful law of pitiless destruction of the weak, the helpless, the sick, and the old, must with Spartan firmness be deliberately carried out. Against such a course we instinctively shrink with abhorrence.

In the most important chapter of this book, that devoted to an examination of the relation of man to nature, the author sets forth clearly and fairly the conclusions of the materialists, and fairly the conclusions of the spiritualists, and then passes directly to his view of the origin and destiny of man's spirit. From the relation of man to nature one would proceed by a natural transition to the relation of God to man, but for what the author has to say upon the latter subject we must refer the reader to the book itself.

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It is of course intelligible that physical changes in sense organs transmitted along nerve fibres should determine changes in brain substance. But now there appear, and it is impossible to imagine how, consciousness, thought, emotion, and feeling, which are entirely different from any belonging to an entirely different world. So different that it is impossible to imagine the nature of the nexus between physiological and psychological phenomena, or to construe the one in terms of the other. Brain cells are agitated and thought appears. Aladdin's lamp is rubbed and genies show themselves. There is just as much intelligible causal relation between the two sets of phenomena in the one case as in the other. Nor is this mystery one of those whose nature it is to vanish under the light of knowledge. On the contrary, science only brings it out sharper and emphasizes its absolute unaccountableness. Suppose, by way of illustration, that we could expose the brain of a living man in a state of intense activity; suppose, further, that our senses were absolutely perfect, so that we could see every change of whatever sort taking place in the brain substance, and that we could see, obviously nothing but molecular changes, physical and chemical, for to the outside observer there is absolutely nothing else there to see. But the subject of this experiment sees nothing at all. His experiences are of a different order, viz., consciousness, thought, emotion, etc. Viewed from the outside there is and can be nothing but motions; viewed from the inside nothing but thought, etc.; from the one side only physical phenomena; from the other side only psychological phenomena; from the nature of the case it must ever be so. We cannot see the mind, and the mind cannot see the brain; the one is the brain, the other the mind. Certain ink scratches or blotches utterly meaningless to the one looking through and appear on the other as intelligible writing, but how we know not, and can never hope to guess. When the paste disintegrates, the chair of Prof. Le Conte is a question to which all of us would like to see a decisive answer.

It may, indeed, be objected that there is nothing specially strange, nothing unique in the unintelligibility of psychological experiences from a physiological point of view, for the same is true of the viewpoint of the mind on the other side. We cannot see the brain, and the brain cannot see the mind. Certain ink scratches or blotches utterly meaningless to the one looking through and appear on the other as intelligible writing, but how we know not, and can never hope to guess. When the paste disintegrates, the chair of Prof. Le Conte is a question to which all of us would like to see a decisive answer.

Let us now see whether we do not encounter a corresponding shortcoming in the other branch of the argument for materialism, that, namely, which is derived from the law of evolution. If, as the materialists say, the congenies of physical qualities, which we call the sense organs, are the only basis of evolution, it seems incumbent upon them to take up at what point in the ascending scale of evolution it entered. This, however, they cannot do. What are the physical qualities? Evidently consciousness, thought, will, memory, love, hate, fear, and desire, are some of them. But how do these differ from any other? Pressed with this difficulty, some have felt compelled to accord even immortality to the higher animals. But we cannot stop here. If spirit belongs to these, then it belongs also to all animals, for we have here only a sliding scale without any definite line of demarcation. It is an extensive with sentience? No; for the lowest animals and lowest plants merge into each other so completely that no one can draw the line between them with certainty. We must, therefore, extend spirit to plants also. Shall we stop even here and make spirit coextensive with life? We cannot, for the difference between the lower and the higher is too great to be correlated with, transmittable into, and derivable from physical and mental forces. We must, then, recognize the existence of spirit in dead nature also. It follows that everything is immortal or that nothing is. Consciousness or even immortality has by long extension become too thin and too thin to be evaporated into air. It has shrunk into naught but conservation of energy, and has kept no trace of the hoped-for conservation of self-conscious personality.

This difficulty presented in the taxonomic series, each one of us individually, is formed gradually in his mother's womb by a process of evolution from a microscopic spherule of protoplasm undistinguishable in structure from the lowest forms of protoplasmic life. Now, in this gradual evolution, the individual body is developed, and it is this body which we like to think immortal, come it? Was it in the germ cell? Then why deny it to the protoplasm? Was it at the quickening, or at the birth, or at the moment of first self-consciousness, or at some later period of capacity of abstract thought? Again, when it did not exist, what was it? Did it already exist? Did it grow out of something already existing in the embryo of the infant? To none of these questions does the materialist give an answer.

The author of this book holds that the congenies of physical qualities to which we would like to give immortality, are the products of a scale of evolution with the advent of man; that it was, however, no new thing added at once out of hand, but that it grew out of something already existing in animals. This he deems the only tenable view, the only view that does not involve a contradiction between the two trends, mutually exclusive, which are usually accepted; the only view, in other words, which can satisfy the test of a rational philosophy. Prof. Le Conte believes that the spirit of man was developed out of the *anima*, or conscious principle of animals, and that the first spiritual development was the development of the lower forms of life, and this in its turn out of the chemical and physical forces of nature. He believes that at a certain stage in this gradual development, viz., with the advent of man, this spirit acquired the property of immortality precisely as it now in the individual history of each man at a certain stage acquires the capacity of abstract thought. This view is the author's own, having been promulgated many years before Mr. A. B. Wallace gave a qualified assent to it, and, therefore, for its acceptance, he is constrained to appeal not to authority, but to reason solely.

Our attention is first invited to the fact that there is nothing wholly exceptional in the assumed transformation, coupled with the sudden appearance of new powers and properties. On the contrary, such a metamorphosis and emergence of distinct capacities has many analogies in the lower forces, and is, consequently, a priori not wholly credible but probable. For example, force and matter may be said to exist now on several planes raised one above another. These exhibit a sort of taxonomic scale. There are, first, the plane elements assembly, the plane of chemical compounds; thirdly, the plane of vegetable life; fourthly, the plane of animal life; and fifthly, the plane of rational life, as men hope, immortal life. Each plane has its own appropriate forces and distinctive phenomena. Moreover, although the planes are distinct, they are not mutually exclusive, yet there is a very distinct break between any one of them and its predecessor.

between any one of them and its predecessor or successor. That is to say, although there are various degrees of the force characteristic of each plane, yet the difference between the planes is one of kind as well as of degree. Although the forces of transmutation may take all these different forms, and thus does now circulate up and down through all these planes, yet the passage from one plane upward to another is not a gradual passage by sliding scales, but a passage accomplished at one bound, and the history of the evolution of the cosmos the necessary conditions are present, a new and higher form of force at once appears, like a birth into a higher sphere. Thus there was a time in the history of the earth when only physical forces existed, chemical and physical forces, and the history of the evolution of the cosmos the necessary conditions are present, a new and higher form of force at once appears, like a birth into a higher sphere. 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